

REMARKS

The Applicant has studied the Office Action dated April 7, 2004. Reexamination and reconsideration of this application is requested. By this response, claims 1 - 47 are pending in the application. It is submitted that the application is in condition for allowance. Reconsideration and allowance of the pending claims in view of the following remarks are respectfully requested. In the Office Action, the Examiner:

- (1-5) rejected claims 1-4 and 7 under 35 U.S.C. § 103(a) as being unpatentable over Bates et al., (U.S. 6,587,967); and
- (6) objected to claims 5, 6, 10, 11, 19, 20, 24, 32, 33, 37, and 38 as being dependent upon a rejected base claim but would be allowable if rewritten in independent form including all the limitations of the base claim and any intervening claims; and
- (8-22) rejected claims 8, 9, 12-18, 21-23, 25-31, 34-36, 39-47 under 35 U.S.C. § 103(a) as being unpatentable over Bates et al., (U.S. 6,587,967).

Allowable Subject Matter

As an initial matter, the Applicant also wishes to thank Examiner Iqbal for indicating the allowable subject matter of claims 5, 6, 10, 11, 19, 20, 24, 32, 33, 37, and 38.

Overview of the Current Invention

Preferred Embodiments of the present invention provide an improved method, apparatus and computer readable medium for providing systematic and reliable monitoring of interrupt routines that are critical for the operation of a programmed system. The present invention ensures that two or more program sequences run through iterative cycles as expected using a built-in monitoring procedure. Unlike prior art solutions which rely on external monitoring programs, the present invention teaches the use of two more programming sequences running sequentially to monitor each other respectively. As an example, in the case of a two program sequence, the first program sequence is made to monitor the execution of the second programmed sequence. Also, the second program sequence is made to monitor the first program sequence. In one

embodiment the first programmed sequence incorporates the steps of resetting a first counter associated with the first program sequence. The second program sequence includes resetting the second counter and incrementing the first counter. This cross-monitoring of the first program sequence with the second program sequence ensures that a failure in the activation of a particular program sequence is detected by monitoring the counter by the other corresponding i.e. first or second sequence.

Further, in the more generalized case with N program sequences, where each of the program sequences are executed iteratively, each of the programmed sequence is monitored by at least one other programmed sequence. This provides built-in monitoring which is different than the external monitoring of the prior art.

In order to more particularly point out these features, the patentably distinct features of independent claims 1, 16, and 28 (with similar elements in claims 35 and 43) have been reproduced below for convenience:

at least a first and a second programmed sequence, each to be executed iteratively,

wherein said first programmed sequence is made to monitor the execution of said second programmed sequence, and said second programmed sequence is made to monitor said first programmed sequence.

(6, 8-22)Rejection under 35 U.S.C. §103(a) over Bates

As noted above, the Examiner rejected claims 1-4 and 7 under 35 U.S.C. § 103(a) as being unpatentable over Bates et al., (U.S. 6,587,967) and rejected claims 8, 9, 12-18, 21-23, 25-31, 34-36, 39-47 under 35 U.S.C. § 103(a) as being unpatentable over Bates et al., (U.S. 6,587,967). The Applicant respectfully traverses this rejection. As the Examiner correctly states on page 2 of the Office Action, "*Bates teaches a program product and method of executing a portion of a multithreaded program and monitoring threads that are executing within a selected monitored region in the program while the portion of the program is executing.*" To begin, careful reading of Bates teaches the

term "multithreaded." Multithreaded is a term widely used in the programming arts and is commonly defined as a part of a program that can execute independently and execute concurrently.¹ In contrast, the present invention recites independent claims 1, 16, and 28 (with similar elements in claims 35 and 43) have been reproduced below for convenience (Emphasis Added).

at least a first and a second programmed sequence, each to be executed iteratively,

Bates teaching of "threads" executing "concurrently" is not the same as a program sequence executing iteratively. The two can not be confounded. The present invention has two or more program sequences set to run iteratively. The present invention solves the problem to ensure that these two sequences do indeed complete their respective iterative cycles. Bates is completely silent on this solution. Further, the Examiner makes an unsupported conclusory statement that on page 2 of the Office Action "*He thus teaches limitations pertain to monitoring the activation of programmed sequences, each to be executed iteratively.*" (Emphasis Added). In fact, the Applicant respectfully submits that Bates teaches away from reciprocal monitoring by two or more program sequences, where each of the program sequences are "each to be executed iteratively." See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988).² In contrast, Bates

¹ See online URL <http://www.pcwebopedia.com/TERM/t/thread.html> In programming, a part of a program that can execute independently of other parts. Operating systems that support multithreading enable programmers to design programs whose threaded parts can execute concurrently.

² The Federal Circuit held that a reference did not render the claimed combination *prima facie* obvious because *inter alia*, the Examiner ignored material, claimed temperature limitations which were absent from the reference. See MPEP §2143.01 In *re Fine*, the claims were directed to a system for detecting and measuring minute quantities on nitrogen compounds comprising a gas chromatograph, a converter which converts nitrogen compounds into nitric oxide by combustion, and a nitric oxide detector. The primary reference disclosed a system for monitoring sulfur compounds comprising a chromatograph, combustion means, and a detector, and the secondary reference taught nitric oxide detectors. The examiner and Board asserted that it would have been within the skill of the art to substitute one type of detector for another in the system of the primary reference; however the court found there was no support or explanation of this conclusion and reversed.

teaches Bates "threads" executing "concurrently" which is not the same as a program sequences executing iteratively. Accordingly, independent claims 1, 16, and 28 (with similar elements in claims 35 and 43) distinguish over Bates for at least this reason.

Continuing further, the Examiner states on page 2 of the Office Action *"He thus teaches first programmed sequence is made to monitor the execution of the second program sequence."* The Applicant respectfully disagrees. Careful study of Bates teaches that a user can specify one or more sections of one or more computer programs for which thread activity is to be monitored. Using the Examiner's reasoning there must be some teaching or suggestion in Bates corresponding to the language as recited in independent claims 1, 16, and 28 (with similar elements in claims 35 and 43) "wherein said first programmed sequence is made to monitor the execution of said second programmed sequence, and said second programmed sequence is made to monitor said first programmed sequence." The Applicant respectfully submits that the language referred to by the Examiner in Bates at col. 3, lines 44-46 *"A user can specify one or more sections of one or more computer programs for which thread activity is to be monitored"* is not the same as having a first program sequence which is made to monitor the iterative execution of a second program sequence. In contrast, Bates explicitly teaches the selection of the monitored region of a multi-threads program, for determining which thread activity is to be monitored among the number of threads simultaneously or concurrently executing within a computer program. There is no suggestion or teaching of "at least a first and a second programmed sequence, each to be executed iteratively." Accordingly, independent claims 1, 16, and 28 (with similar elements in claims 35 and 43) distinguish over Bates for at least this reason as well.

Continuing further, the Examiner correctly states on page 2 of the Office Action *"He does not explicitly disclose the second programmed sequence is made to monitor the first programmed sequence"* (Emphasis Added). Next the Examiner goes on to state *"It would be obvious to a person of ordinary skill in the art at the time the invention was made to realize that (sic)."* The Applicant respectfully disagrees. Bates does not suggest or teach the reciprocal monitoring, as in the case of present invention. The

Examiner goes on to state that in the Office Action at the top of page 3 *"He clearly provides the capability to monitor the first programmed sequence to monitor the execution of the second programmed sequence, and second programmed sequence is made to monitor the first programmed sequence."* The Applicant respectfully disagrees with the Examiner's rationale.³ The mere fact that threads to be filtered and executing concurrently may be filtered does not suggest a reciprocal monitoring, but simply suggests that some threads that are executing in the region may be monitored depending on predetermined criteria. Bates is completely silent on this reciprocity of monitoring. As further rationale for this, the Examiner goes on to state on page 3 of the Office Action: *"This is because he teaches as stated above that a user can specify one or more sections of one of (sic) more computer programs for which thread activity is to be monitored and also teaches (col. 2, lines 66, 67) that the threads to be monitored may be filtered, such as by specifying threads to be included or excluded, therefore clearly allows one to specify the first programmed sequence is made to monitor the execution of the second programmed sequence and the second programmed sequence is made to monitor the first programmed sequence."* The Applicant disagrees. Turning to Bates at col. 3 lines 58-67, the mere fact that each of the threads includes a thread identifier, the monitoring of the threads that are executing within a selected monitored region including storing of the thread identifiers for the threads that are executing within the selected monitored region while the program is executing, and suspending all threads when the stored thread identifiers exceed a monitor threshold does not suggest, or teach reciprocal monitoring by "a first and second programmed sequence". Bates is completely silent on this inventive check-and-balance system of at least a first and second programmed sequence running iteratively with cross checks. Accordingly, independent claims 1, 16, and 28 (with similar elements in claims 35 and 43) distinguish over Bates for at least this reason as well.

³ If, however, the Examiner's statements are based on facts within the personal knowledge of the Examiner, the Applicant respectfully requests that the Examiner support these references by filing an affidavit as required under MPEP §707 citing 37 CFR 1.104(d)(2).

It is important to note that the check-and-balance system of mutual monitoring as recited in the independent claims 1, 16, 28, 35 and 43 is not limited to just a first and a second programmed sequence. In another embodiment, the present invention teaches two or more i.e. multiple, monitoring programs, each monitoring another monitoring program to create a "round-robin" monitoring condition. See Specification at page 11. This embodiment is an extension of the mutual monitoring of just two programmed sequences. Previously added claims 43-47 clarify this embodiment.

Continuing further, when there is no suggestion or teaching in the prior art for "wherein said first programmed sequence is made to monitor the execution of said second programmed sequence, and said second programmed sequence" the suggestion can not come from the Applicant's own specification. The Federal Circuit has repeatedly warned against using the Applicant's disclosure as a blueprint to reconstruct the claimed invention out of isolated teachings of the prior art. See MPEP §2143 and Grain Processing Corp. v. American Maize-Products, 840 F.2d 902, 907, 5 USPQ2d 1788 1792 (Fed. Cir. 1988) and In re Fitch, 972 F.2d 160, 12 USPQ2d 1780, 1783-84 (Fed. Cir. 1992). Bates does not even suggest, teach nor mention reciprocity of monitoring tasks.

Very recently, the Federal Circuit again took up the identical question of Obviousness in combining references in the case In re Sang Su Lee, No. 00-1158 (January 18, 2002). In this case, the Board of Patent Appeals rejected all of the Applicant's pending claims as obvious under § 103. The Federal Circuit vacated and remanded. Citing two prior art references, the Board stated that a person of ordinary skill in the art would have been motivated to combine the references based on "common knowledge" and "common sense," but it did not present any specific source or evidence in the art that would have otherwise suggested the combination. The Federal Circuit held that the Board's rejection of a need for any specific hint or suggestion in the art to combine the references was both legal error and arbitrary agency action subject to being set aside by the court under the Administrative Procedure Act (APA). Accordingly, with the

suggestion or motivation found in Bates, the Examiner has failed to properly establish a prima facie case of obviousness of the invention as a "whole." Accordingly, independent claims 1, 16, 28, 35 and 43 of the present invention are distinguishable over Bates for the reasons set forth above.

Claims 2-15, 17-27, 29-34, 36-42, and 44-47 depend from claims 1, 16, 28, 35 and 43 respectively. Since dependent claims contain all the limitations of the independent claims, claims 2-15, 17-27, 29-34, 36-42 and 44-47 distinguish over Bates, as well, and the Examiner's rejection should be withdrawn.

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CONCLUSION

The remaining cited references have been reviewed and are not believed to affect the patentability of the claims as amended.

In this Response, Applicant has amended certain claims. In light of the Office Action, Applicant believes these amendments serve a useful clarification purpose, and are desirable for clarification purposes, independent of patentability. Accordingly, Applicant respectfully submits that the claim amendments do not limit the range of any permissible equivalents.

Applicant acknowledges the continuing duty of candor and good faith in the disclosure of information known to be material to the examination of this application. In accordance with 37 CFR §1.56, all such information is dutifully made of record. The foreseeable equivalents of any territory surrendered by amendment are limited to the territory taught by the information of record. No other territory afforded by the doctrine of equivalents is knowingly surrendered and everything else is unforeseeable at the time of this amendment by the Applicant and its attorneys.

Applicant respectfully submits that all of the grounds for rejection stated in the Examiner's Office Action have been overcome, and that all claims in the application are allowable. No new matter has been added. It is believed that the application is now in condition for allowance, which allowance is respectfully requested.

PLEASE CALL the undersigned if that would expedite the prosecution of this application.

Respectfully submitted,

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